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TECHNOLOGY DEPT.

JULY 8, 1950

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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DETROIT

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MEDICINE

From Now On: Chronic Ills

Obesity control will help to prevent many common chronic ailments. Screening tests will help detect the causes of future disease.

By WATSON DAVIS

Fifteenth in a series of glances forward in science.

► IN olden days there were so many catching diseases causing premature death that many people did not live long enough to have the chronic diseases.

But the chronic diseases have been with us a long time. The golden harvest of the patent medicine man of former years was reaped largely from those who suffered from the pains of "rhumatiz" and other forms of chronic bad health. Some of these ill are virtually wiped out by today's successful treatments for the infectious diseases and their after-effects. Others are still with us.

The complex of ill that may properly be labeled "chronic" make a gigantic drain on the nation. Dr. A. L. Chapman, chief of the U. S. Public Health Service's division on chronic disease, figures that this combination of diseases:

Causes a million deaths a year.

Fills five out of six of our hospital beds.

Steals a billion man-days of work each year.

Not all of the so-called chronic diseases are uncontrollable. Many of them, such as

malaria, pellagra, pernicious anemia, hay fever and asthma, the venereal diseases, epilepsy and diabetes, can be dealt with successfully by known methods.

One thing to do in handling the situation is to start early with the people while they are young, both to prevent later illness and to prepare for the inevitable difficulties of old age.

The medical profession and the public health experts have been so busy with the acutely ill in past years that they have had little time to work out the newer methods needed for the chronic ill.

Some of the practical experiments under way include:

A. Obesity control, because getting the excess fat off of people helps prevent hypertension, diabetes, heart disease and even cancer and arthritis. The aim is not to reduce weight alone but give motivation to maintain the weight loss.

B. Attempting to discover hidden causes of future disease by screening tests, not for just one disease, but for all that can be picked up early. Tests of this are being made in Indianapolis and Boston.

C. Communities are attempting to reduce the cost of chronic diseases by better methods of home care and rehabilitation.

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MEDICINE

Pain-Killer for Heart

► THE local anesthetic which dentists use as a pain-killer has been converted by chemical modification into a powerful new drug for certain kinds of heart trouble.

Complete success with the drug in treating 13 of 15 patients and partial success in two was reported by Drs. Herbert J. Kayden, Lester C. Mark, J. Murray Steele and Bernard B. Brodie of New York University-Bellevue Medical Center at the meeting of the American Heart Association.

The new drug is called procaine amide. The parent drug is procaine, or novocain as it is also known. Procaine amide will be made immediately available on prescription under the trade name of Pronestyl.

The drug abolishes irregular rhythms of the heart known as ventricular tachycardias. Tachycardias are palpitations in layman's language. When they occur in the ventricles of the heart they are a most serious disturbance because of the ever present possibility of ventricular fibrillation developing. This last condition is one in which the fibers of

the heart muscle twitch separately and irregularly instead of all together. It may be fatal.

Procaine amide was made, along with a number of other related chemicals, after scientists had found that procaine injected into a vein abolished the extra heart beats which frequently occur during operations under anesthesia.

Procaine, however, is very quickly destroyed in the body and cannot be given by vein injection to conscious patients because it stimulates the central nervous system violently, even giving rise to convulsions.

Search for a drug without these disadvantages but with procaine's effect on the heart led to procaine amide.

The new drug acts quickly and can also be given by mouth. It is more powerful and less toxic than quinidine, drug now used for ventricular tachycardia.

Besides being effective in this condition, procaine amide will abolish the frequently annoying extra heart beats that have their

origin in the ventricle of the heart. Though annoying, these extra heartbeats are not dangerous, but they often cause anxiety in those who have them.

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MEDICINE

Film Teaches Women to Examine Selves for Cancer

► A NEW and very personal way in which American women can actively fight cancer has been devised. It consists of a motion picture film designed to teach them how to examine their own breasts each month for early signs of cancer.

"Within the next few years, breast cancer may be reduced as a national problem," is the hope for the film expressed by Dr. Austin V. Deibert, chief of the U. S. National Cancer Institute cancer control branch.

The National Cancer Institute and the American Cancer Society are co-producers of the film. It was shown for the first time to physicians and newspaper writers at the meeting in San Francisco of the American Medical Association. Plans are to distribute it throughout the country for showing to women's organizations.

Of the 50,000 women who develop breast cancer each year, more than half are doomed to die within five years of diagnosis because the disease is not recognized until it reaches an advanced stage, Dr. Charles S. Cameron, medical and scientific director of the American Cancer Society, states.

Between 80% and 90% of these deaths could be prevented, he reports, if women themselves recognized the early stages of breast cancer.

Tumors as small as a half inch in diameter can be detected by the simple, four-step technique of breast examination taught in the film.

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METEOROLOGY

East Cooler Than Normal, West Warmer in July

► THE weather will be good to the East during July—not so good to the area west of the Mississippi.

The Weather Bureau's 30-day outlook predicts that temperatures east of the Mississippi will be below normal, and quite a bit below normal in the center of that area. In addition, substantial showery rainfalls are predicted during the month for the same region, especially in the southeast and along the Atlantic seaboard.

The nation's dustbowl area is in for a month of subnormal rainfall. This is also true for the rest of the country west of the Mississippi. This will be accompanied by higher than normal temperatures, except for the Pacific coast where normal temperatures are expected.

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MEDICINE

Effects of Nerve Gases

Terrific eye pain, headache, inability to breathe and convulsions are symptoms of poison from military nerve gases. The poison remedy is atropine.

► THE most poisonous and most devastating war gases yet revealed—the nerve gases—were discussed in San Francisco in the first detailed report on these specialized poisons released by the Army.

Col. John R. Wood, since 1945 chief of the medical division of the Army Chemical Center at Edgewood, Md., told members of the American Medical Association how these nerve gases affect the body and what the remedy is.

Terrific eye pain, headache, inability to breathe and convulsions are among the symptoms preceding death from military nerve gas.

The poison remedy is atropine. Col. Wood did not give the names of any of the nerve gases in his report, though he indicated that they are similar to some of the newer insect killers, such as parathion and tetraethyl pyrophosphate, or TERP as it is called for short.

These nerve gases, he said, "are a family of chemicals having the common property of irreversibly inhibiting the enzyme, cholinesterase."

This blocks a vital body chemical reaction and allows excessive accumulation of another body chemical, acetylcholine, at the junction between the end of a nerve and the muscle it stimulates.

The nerve gases are almost colorless and odorless. They do not even cause any smarting of the skin or choking which would warn of their presence. They are more poisonous than formerly known war gases.

They can get into the body by inhalation of the vapor, or gas, or by absorption of the liquid form through the skin or eyes, or by being swallowed.

Atropine, the remedy reported by Col. Wood, was the German first aid treatment for nerve gas poisoning. This drug is the one eye specialists drop in eyes before examination for eye-glasses. It, or belladonna of which it is the active principle, is also used as an antispasmodic and many a patient with colitis has swallowed atropine drops in water for relief of his symptoms.

Very large doses of it must be used to counteract the nerve gases, Col. Wood said. But there is danger in using it in very severe cases with profound and prolonged oxygen lack due to the paralysis of breathing muscles. In these cases artificial respiration must be given first. The atropine, when used, is injected into the muscles or veins.

Treatment of nerve gas victims must be started very fast if they are to be saved. And the atropine doses must be repeated

every few hours for several days because the poisoning is much more persistent than the atropine effects.

When liquid nerve gas has been splashed on the skin, immediate swabbing with an alkaline fluid, such as ordinary household ammonia, is recommended. Clothing splashed with the liquid gas should be removed at once and left outdoors. Patients should not be admitted to hospitals or other enclosed spaces until all liquid nerve gas contamination of skin and clothing has been eliminated, Col. Wood warned. Otherwise the vapors will endanger other patients and hospital personnel.

The statement, often made, that these nerve gases will "destroy the enemy's will to fight" does not refer to any strange effect on the human body. The nerve gases can paralyze, convulse and kill. Used against an army or a population, they might convince an enemy that there was no use in continuing to fight, much as the atom bomb convinced the Japs that it was time to surrender.

The standard gas mask of our army will protect against nerve gases. And our army's protective clothing will protect against the liquid form.

The details about nerve gases were given

to the doctors meeting because it is felt that for civilian defense it is best to have such information given to the medical world. Knowledge of what to expect and how to handle it, military authorities believe, will reduce the casualties that come from fear and panic over a new weapon such as the nerve gases.

Further reassurance for civilian defense, not mentioned by Col. Wood in his report, comes from British sources which indicate that buildings with ventilating systems could readily be decontaminated by putting chlorine or ammonia into the air inlet tube.

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PSYCHOLOGY

Lie Detector Reveals Problem Children

► A LIE detector used in reverse is serving to spot a "dead-pan" emotional abnormality of children associated with delinquency.

As ordinarily employed, the lie detector reveals emotional response of an individual under questioning by recording changes in the electric conductivity of the skin.

Used with a very sensitive photoelectric recorder, the lie detector can be used to spot those who have no emotional response at all to situations that commonly rouse anger, fear or other strong emotion. This "dead pan" reaction was found characteristic of problem children, 85% of whom had spent time in disciplinary and penal institutions.

This novel use of the recorder, a General Electric product, is reported by Bernard R. Higley, of the Alfred L. Wilkon Children's Center, Columbus, Ohio.

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DETECTOR FOR DELINQUENTS—The lie detector is being used with a sensitive recorder to spot problem children, many of whom are juvenile delinquents. The problem children tend to exhibit a "dead pan" lack of emotional reaction.

PHYSICS

Radioactive Greenhouse

See Front Cover

► THE new greenhouse looks like all the others at the Department of Agriculture's huge plant industry station at Beltsville, Md. But around it is a seven-foot-high chain link fence. Signs on the fence, bearing the three-segmented red symbol of the Atomic Energy Commission, read: DANGER—Area Used For Radioactive Materials; Admission by Permit Only.

As equipment was being moved into the AEC-built, \$250,000 greenhouse last week, the Commission and Agriculture Department announced they are ready for "one of the important peacetime projects made possible by atomic energy."

Radioactive tracer materials hotter than any used so far in plant research will be the principal tools in the specially-equipped greenhouse, where government scientists will track down secrets of growth from the soil.

"None of the work will be secret," said Dr. F. W. Parker, assistant chief of the Bureau of Plant Industry. Admission to the area will be restricted only because of radiation hazards, he explained. Research workers will be trained in taking needed precautions.

To protect workers on the "Radioactive Isotope Project," the greenhouse has many special features. Stainless steel plates line the doors to the basement section where tracer materials, mainly from the atomic energy plant at Oak Ridge, Tenn., will be received.

The photograph on this week's cover of SCIENCE NEWS LETTER shows the 18-inch-thick concrete "well" in an underground room beyond the greenhouse proper where cans of the radioactive isotopes will be stored. Dr. L. T. Alexander who heads the

radioactive project is at the left in the picture, and Arnold MacKenzie, a project chemist, is at the right. All handling here will be by remote control. The floor, as in other rooms where contamination is likely, is of asphalt tile easily replaceable should radioactive materials be spilled on it.

There are special sinks in each section of the greenhouse, piped to carry contaminated wastes into a special receptacle. Exhaust systems from lead-lined hoods contain filters to catch radioactive particles in the air.

Previous uses of radioactive "tagged" elements have shown their value in plant science. The Department of Agriculture, together with AEC and many state agricultural experiment stations, have used tracer materials in studying plants and soils for more than three years.

The new greenhouse will permit new radioactive elements to be used, among them calcium, zinc and sulfur, Dr. Alexander said.

Both inside the greenhouse, where water flowing over the glass roof will aid in controlling temperature, and on the two-acre plot surrounding the new building, studies will be carried on to learn more of how plants draw nutrition from various types of soil.

By substituting for normal elements in the soil the same elements made radioactive, researchers will be able to trace with Geiger counters and other instruments of the atomic age the way in which crops absorb their food and flourish—or wilt and die—under various conditions of U. S. farming.

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● RADIO

Saturday, July 15, 1950, 3:15 p.m., EDT

"Adventures in Science" with Watson Davis, Director of Science Service, over Columbia Broadcasting System.

Mr. Davis will discuss "Our Atomic Future."

Growth or loss of hair depends upon heredity, the supply of sex hormones and on age.

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PHYSICS

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MEDICINE

Pituitary Gland in Cancer

When pure growth hormone is given to rats, they not only double their normal size, but they get cancers. The reason for this effect is not known.

► A NEW idea of how cancer starts is developing from studies reported by University of California medical researchers at the meeting of the American Medical Association in San Francisco.

The pituitary gland, tiny but powerful organ at the base of the brain, is involved. This gland is known to produce half a dozen or more hormone chemicals, among them ACTH, currently famous for the dramatic relief it has brought in arthritis and other conditions.

ACTH acts on the cortex, or outer part, of the adrenal gland. But it is the growth hormone of the pituitary gland that is arousing scientific interest in connection with cancer.

When this hormone in pure form is given to normal rats, the animals grow twice the normal size. But they also get cancer. Some of the animals got cancers in the lungs. Others got them in the ovaries. In one instance, four different tumors, or cancers, developed on one ovary. And some animals got a very rare form of adrenal gland cancer. Almost all of the rats got cancers of the breast tissues.

These results occurred when the animals were given the pure growth hormone over a long period, about half the animal's nor-

mal life span.

Just why the pituitary gland growth hormone has this effect is not known. Cancer, of course, is a form of abnormal growth, but pituitary growth hormone ordinarily is a stimulator of normal growth. When given to animals that have had their own pituitary glands removed, the pure growth

ANTHROPOLOGY

Hunger Regulates Lives

► WHEN a people live in a state of semi-starvation, hunger dominates their lives. Hunger becomes such a motivating factor that they will kill useless persons, regulate their love life by the state of their food supply and dream at night about food.

This was discovered in a year's study of a nomadic Indian tribe of Bolivia, so dominated by the need for food that other skills, the arts and religion had either been lost or were never learned.

The study was made by Dr. Allan R. Holmberg, anthropologist, and was issued by the Smithsonian Institution in Washington.

Dr. Holmberg found that this tribe—the

hormone stimulates growth without producing cancers.

Next experiment the California researchers want to try is injection of a known cancer-causing chemical, such as methylcholanthrene, in rats without pituitary glands, to see whether the cancers develop in the absence of growth hormone.

The experiments may shed some light on why sex hormones bring temporary relief in some forms of cancer, and they give some rational basis for the often-suggested idea of irradiating the pituitary gland in the hope of controlling cancer.

The studies reported at the meeting were by Drs. Henry D. Moon, Miriam E. Simpson, Choh Hao Li and Herbert M. Evans.

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Siriono Indians—even wore no clothes, although a scorching sun and hordes of insects would seem to make clothing imperative.

The Siriono were selected for study because they are almost constantly hungry, depending almost entirely on wild game and fish, berries, nuts and other wild food from the forest to keep them from starvation. Following up studies made at Yale's Institute of Human Relations, Dr. Holmberg wanted to find out what effect the anxiety and frustration caused by continuous food shortage would have on the people suffering them.

Among a people who are always hungry, food becomes the greatest interest in life, Dr. Holmberg found. People do not marry for love among the Siriono. Wives and also "other women" outside the home are wooed by promises of food. Young girls fall for the man who is the best hunter. And wives quarrel with their husbands not because of infidelity but because he gives food to another woman.

Even sexual activity is governed by the food supply. When the food deprivation is relieved temporarily by an abundance of food, as when a hunter returns with a good bag of game, everybody eats to excess. The periods of deprivation, Dr. Holmberg observed, are accompanied by sexual abstinence; periods of gluttony are followed by sexual excesses.

The backwardness of the Siriono people is blamed, at least in part, by Dr. Holmberg on their preoccupation with the food problem. Technology is mostly absent, art non-existent, social and political organization relatively simple.

The hunter must walk as far as 20 miles in a day searching for game, but roads are unknown and trails not cleared. Although waterways are abundant, canoes or boats are unknown.

The Siriono is aggressive. He fights for his share of food. He eats principally alone



FLAMINGO'S NEST—Despite their captivity in the San Antonio zoo, the two flamingos in the center do not allow that to interfere with their plans for a family, as they constantly continue to set on the one egg. This is one of the rare instances of flamingos nesting in actual captivity.

in the night or during the day may steal off in the forest to eat. He eats whenever he can, even if he is not hungry, and even when he sleeps, he dreams about food.

The old and very sick who might prove a burden on the food supply are often callously abandoned to die.

The single exception to the every-man-for-himself attitude of the Siriono is his

treatment of children. Children are loved to excess and overindulgently treated. When a mother feels that she must punish her child, she herself weeps. Babies are nursed until they are about three years old. And when a child is suffering from hunger, fatigue, or pain, he is shown more love than at other times.

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BIOLOGY

Germ Warfare in Korea?

► GERM warfare may get a trial very soon, if the fighting in Korea continues. The situation might be considered by the Soviets as a good one in which to stage a trial of such a weapon, if they have developed a satisfactory method of using it.

B. W., short for biological, or germ warfare was mentioned in San Francisco, as a possibility "in the event of future wars" in a report by Dr. Joseph E. Smadel, of the Army Medical School, at the second military medical session at the American Medical Association meeting.

Dr. Smadel did not refer to the Korean situation in his formal paper. But he did say, discussing germ diseases of future wars, "that these include those human infections caused by microbial agents or their products which might be disseminated artificially by wilful intent." In other words, germs used as weapons.

"This last subject is certainly not one to be dismissed casually, neither is it one to strike hopeless terror into the minds of civilian and military personnel," he stated.

"The risks associated with the limited geographic use of such methods are no more hazardous to persons directly exposed than are the effects of high explosives or nuclear weapons.

"There is no reason to believe that a large scale man-made episode, provided it could be accomplished, would spread and become an epidemic among the unexposed," he added reassuringly.

"Small scale episodes, which are undoubtedly possible, could be delimited and controlled by the present methods available to the public health and civilian and military medical personnel."

Even without germ warfare, there are a number of diseases that may for the first time become military problems. Infantile paralysis is one of these which Dr. Smadel mentioned. Polio "does not at present constitute a military problem but the recent outbreaks of this disease among the Eskimo populations point to a need for considering this malady in troops operating in the Arctic where ordinary sanitation is essentially impossible to maintain," he stated.

One of the numerous viruses, discovered in Africa and South America in recent years by members of the Rockefeller Foundation during their studies on yellow fever might

be the cause of a "new" disease of military significance, he continued.

Among the old diseases which plagued armies in World War II, the following may be expected to appear again in future wars: diarrhea, dysentery, influenza and pneumonia, and, even though they were relatively well controlled, typhus, typhoid and paratyphoid fevers, plague, cholera, smallpox, epidemic meningitis, scarlet fever and streptococcus throat infections and wound infections.

Any American fighting men wounded in Korea are being evacuated by air, if armed forces plans revealed to the American Medical Association are being followed.

Hospital trains and hospital ships are out, in military medical planning. As long ago as last August (1949), air evacuation was adopted as "the sole method of patient movement for the armed forces, replacing hospital ships and hospital trains," Lieut. Col. B. A. Strickland, director of the military medicine division of the Air Force School of Aviation Medicine, announced.

Over 1,423,263 patients were evacuated by air between 1942 and 1949, he reported. Since 1945 only one death has occurred in air evacuation.

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MEDICINE

Device Helps Prevent Baby Suffocation Danger

► NEWBORN babies in danger of suffocating can be saved by a new mechanical device which starts them breathing normally.

The device, called an air lock, was shown to physicians at the meeting in San Francisco of the American Medical Association. It has already lowered the baby death rate at St. Joseph's Maternity Hospital, Houston, Tex., by one-fourth, Dr. Allan Blossom reports. Dr. Blossom is on the staff of the hospital and of Baylor University College of Medicine at Houston.

The newborn baby in danger of asphyxiation is put into a tube-like tank immediately after birth, instead of being slapped, held hanging by its heels or having a suction tube put into its windpipe. Pressures within the lock are automatically regulated to simulate as far as possible those during

the second stage of labor. In normal babies and normal childbirths, the pressures during labor initiate the baby into breathing.

Heat and humidity are regulated and increased oxygen concentrations are furnished. Since the air lock is of glass, baby's behavior while in it can be watched. After baby is in the apparatus, pressure in the air lock is raised to three pounds per square inch by tightly closing the lock. When this level is reached, the lock automatically opens and the pressure is lowered to one pound. Then a switch closes the lock again. This automatic cycling is repeated every 45 seconds. The air lock has been used in 100 cases out of 1,786 deliveries at St. Joseph's Hospital. The death rate in the first four months of this year, other than stillbirths, was 1.9% compared to a mortality rate of 2.5% in the same period of 1949, before the lock was used.

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GEOLOGY

New England May Have Been Sub-Tropical

► SCIENTISTS studying a long-abandoned, almost forgotten coal mine in Brandon, Vt., have come face to face with an intriguing question: Was northern New England once sub-tropical?

Fossilized plants and woody tissue preserved in the soft coal are of types found today only in southern U. S. latitudes, Dr. Elso S. Barghoorn of Harvard and Dr. William Spackman of Penn. State report in the JOURNAL OF THE SOCIETY OF ECONOMIC GEOLOGISTS.

The Brandon deposit of lignite, a fuel that lies between peat and soft "brown coal" in its geologic development, has long been recognized as a geologic black sheep. It isn't where it ought to be. Discovered 102 years ago and actively mined only for a few decades, the pocket of soft, sooty fuel is "as out of place in Vermont as pigmies and palm trees," said Dr. H. A. Meyerhoff of the American Association for the Advancement of Science, who has also studied the geology of the Brandon area.

How the lignite was formed, why it was deposited in Brandon when very few other instances of Tertiary age low grade coal exist in the northeastern United States, are mysteries "for which there is at present no easy resolution," Drs. Barghoorn and Spackman say.

Plants in the Brandon lignite are unusually well preserved. Most of them can be identified with certainty. Of 13 known types, nine grow today only in swamps of the Atlantic and Gulf coastal plain from the Carolinas southward.

"It is evident . . . that the climate which prevailed during the accumulation of the Brandon sediments was very different from that which now prevails in these latitudes," the scientists say.

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MEDICINE

If Atomic War Comes . . .

Food and water will probably be safe in the event of resort to atomic weapons. Gelatin and dextran may be used as plasma substitutes.

► IN the generally grim picture of atomic war medical problems being drawn at the American Medical Association meeting in San Francisco, one note of reassurance was sounded.

Large scale contamination of the water supply of a major city is unlikely, and food supplies will be only partially affected by an atomic bombing. This was reported by Brig. Gen. James P. Cooney, chief of the radiological branch of the Atomic Energy Commission's Military Application Division.

"The amount of radioactive material required to contaminate the water supply of a large city is so great that this hazard seems unlikely," he stated.

Packaged or canned foods will be safe, and unprotected foods may be safe though they would need checking with radiation detection devices before use. A contaminated carcass of beef, for example, could be used by removing the outer, contaminated layers. This, Gen. Cooney explained, is because fission products from atomic bombs stick fast to anything they come in contact with but do not penetrate deeply.

Experience from the planned study and care of a fairly large number of ordinary burn patients will prove helpful for handling atomic burn patients, in the opinion of Dr. Everett Idris Evans, professor of surgery at the Medical College of Virginia.

Dr. Evans does not minimize the vast size and complexity of the problem of caring for burn patients after an atomic attack. But he does not think the type of injury would be different from ordinary burns.

Most peacetime burns, Dr. Evans pointed out, result from exposure to low temperatures over a relatively long period. Burns from hot water or steam are inflicted at temperatures ranging from 60 to 120 degrees Centigrade over periods of approximately a minute down to only a few seconds.

With a "flash burn" such as comes in atomic warfare, presumably there is higher temperature over a shorter period. One scientist, Dr. Herman E. Pearce of the University of Rochester, N. Y., has studied pigs burned by explosion of magnesium and found that these burns looked and healed somewhat differently from ordinary burns.

Two human patients burned by the accidental explosion at close range of quantities of magnesium gave Dr. Evans and associates a recent opportunity to study this kind of burn. The hands and forearms were involved. Shortly after the explosion,

blisters formed on the burned fingers and palms. Closed pressure dressing methods of treatment were used for these patients. The course of recovery and healing of these two patients "was in every way similar to that noted in ordinary burns."

Prevention and treatment of burn shock, emergency dressing of the burn wound and provision of proper amounts of fluid and electrolytes such as salt are still the three important aspects of emergency management of severe burns, Dr. Evans stated.

Gelatin and dextran may have to be used as plasma substitutes in case of mass burn casualties, because there probably won't be enough blood and plasma, Dr. Evans said. Gelatin is "a safe and effective" plasma substitute but presently available solutions of it are not suitable for mass casualty use because of their high viscosity, he said.

He considers dextran effective for burn shock, but is not satisfied that there have been enough studies of possible kidney and liver damage to prove its complete safety. Dextran is a gummy substance produced from milk, beet juice and molasses by bacterial action. It has been used in Sweden as a blood and plasma substitute.

A single, one-piece large burn dressing for extensive burns that can be applied by trained lay persons in about one-sixth to one-tenth the time required for the ordinary pressure dressing has been developed, and will probably be the answer to the burn dressing problem. A simple, glove-like dressing for hand burns is now being worked on. This will be needed because flash burns chiefly affect the hands and face. Most face burns heal best without dressings, Dr. Evans said.

Adequate trial of penicillin or other antibiotics in a salve to be applied to the burns should be made, Dr. Evans declared. If such a salve proved effective it would save a tremendous amount of time, personnel and equipment in treatment of mass burn casualties.

Blood transfusions, the blue dye called toluidine blue, aureomycin and other antibiotics, oxygen and vein feedings of plasma, sugar, minerals and vitamins are measures that may be useful in treating the radiation damage of atom bombs, Dr. J. Garrott Allen of the University of Chicago reported.

The frequent transfusions of blood and doses of toluidine blue would be helpful but not completely successful in controlling the hemorrhage from atomic bomb or other radiation damage, he said.

Aureomycin is "distinctly beneficial to per-

sons receiving borderline lethal exposures" of radiation because of its effect in fighting infection.

The oxygen treatment would be for the anemia and the vein feeding to overcome malnutrition due to appetite loss, vomiting and diarrhea of late stages of irradiation sickness.

Science News Letter, July 8, 1950

ENGINEERING

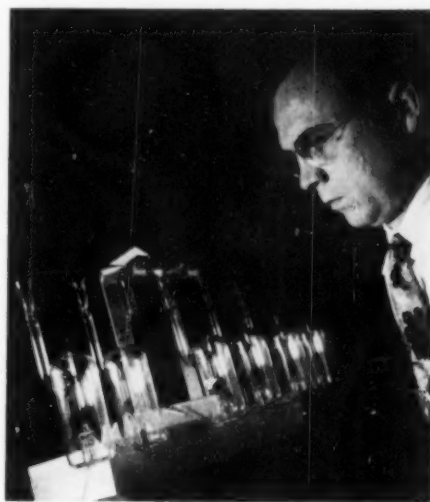
Ion Gauge Measures Low Air Pressure

► AN electronic pressure-gauge, for use in measuring the tiny air pressure remaining in a near-vacuum chamber, is claimed to be 200 times more sensitive than any other ever produced.

The gauge was revealed in Pittsburgh by Dr. Daniel Alpert under whose supervision it was developed by Robert T. Bayard, both of Westinghouse Electric Corporation. It is called an "ion gauge" and is able to detect the presence of air in a vacuum where only one air molecule remains out of every 10,000 billion originally present.

To measure the pressure in a vacuum, the gauge is sealed to the system. When electric power is turned on, electrons are released from the gauge. When these collide with air molecules in their path, they knock off positively charged particles called ions. The number of ions formed in this way is an accurate measure of the pressure inside the vacuum system.

Science News Letter, July 8, 1950



PLENTY OF NOTHING—The electronic gauges which are adept at measuring almost nothing, developed by Robert T. Bayard, can detect air in a vacuum where only one air molecule remains out of every 10,000 billion originally present. This device will aid in exploring regions of ultra-low pressures.

DENTISTRY

Do Not Drink Too Much Citrus Fruit Juice

► A WARNING against drinking too much citrus fruit juice with detrimental effects to the teeth and gums was sounded in Greenwich, Conn., by Dr. Henry Hicks.

Citrus fruits are high in vitamin C required for building connective tissue and bones. Moderate amounts of orange, lemon or grapefruit juice are not condemned by Dr. Hicks.

He states, however, that "it would seem that more than two or three oranges or one grapefruit per week is excessive, in view of the fact that vitamin C is obtainable from other sources."

He bases his warning on more than 50 cases of detrimental effects to the oral cavity, or mouth, noted during the last 15 years. These effects included hypersensitive teeth, bleeding gums and loose teeth. When citrus fruits were removed from the patients' diets, the mouth and gums returned to normal, Dr. Hicks states in his report to the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION (July).

Dr. Hicks recommends that the current popular belief that drinking large quantities of citrus fruit juices is healthful should be carefully appraised.

Science News Letter, July 8, 1950

MEDICINE

Nerve Chemical Found In Nerveless Placenta

► A CHEMICAL usually associated with nervous activity exists in the nerve-free human placenta, which is the organ in the uterus that establishes communication between the mother and unborn child.

The chemical is "true" cholinesterase. There is also a "pseudo-cholinesterase." Existence in the placenta of the true cholinesterase was discovered by Drs. M. G. Ord and R. H. S. Thompson of Guy's Hospital Medical School in London.

Red blood cells, they point out, are the only other nerve-free tissue so far known to contain almost exclusively true cholinesterase.

Details of their findings are reported in the scientific journal, NATURE (June 10).

Science News Letter, July 8, 1950

VETERINARY MEDICINE

Chemical Prevents Poultry Blackhead Disease

► AN economical method of preventing the costly blackhead disease (enterohepatitis) of turkeys and chickens has been found in a new chemical synthesized in Stamford, Conn., at the American Cyanamid Co. laboratories.

Treatment for two weeks with small amounts of the new drug, trademarked Enheptin-T, chemically 2-amino-5-nitrothiazole, kept the poultry alive and flourishing even when purposely infected with the disease.

The drug could be used as a routine, long-term, continuous treatment, it was indicated by Drs. E. Waletzky, J. H. Clark and H. W. Marson in a report to the journal SCIENCE (June 30).

Science News Letter, July 8, 1950

PSYCHIATRY

Ice Pick Operation Helps Patients On "Back" Wards

► A BRAIN operation so simple that 15 can be done in one and one-half hours may help to clear the "back" wards of our mental hospitals, restoring the tragic patients partially if not fully to normal life.

The operation is the "ice pick" one devised two years ago by Dr. Walter Freeman of Washington, D. C. Medically it is known as transorbital leukotomy. A sharp, slender instrument like an ice pick is driven through the bony part of the eye socket into the front of the brain. The instrument is then swung through an arc of 30 degrees and withdrawn. The operation is believed to achieve its results by cutting connections between certain parts of the brain.

The value of the operation in relieving overcrowding in state mental hospitals was stressed by Dr. Matthew T. Moore of the University of Pennsylvania Graduate School of Medicine and Drs. Ralph L. Hill and Wilbur M. Lutz of the Wernersville, Pa., State Hospital at the meeting of the American Medical Association in San Francisco.

Improvement in 77 out of 102 patients at this hospital followed the operation, they reported. Twenty-five patients were able to go home.

Even a little improvement in schizophrenia patients, they pointed out, constitutes a major advantage in a state hospital in that such patients who have been nursing problems show improvement in behavior.

A large part of the patients were from the "back" wards and had been considered permanently nonsalvageable custodial cases. Patients ill more than 10 years showed improvement.

There were two deaths, a mortality rate lower than that experienced in other types of operations in mental cases.

Patients were able to be out of bed within 24 to 48 hours and needed no nursing care after the immediate post-operative period.

As a result of their experience, the Pennsylvania doctors recommend that patients admitted to state hospitals should be offered the advantages of this operation when other forms of treatment have repeatedly failed.

Science News Letter, July 8, 1950

IN SCIENCE

CHEMISTRY

Antibiotics in Cattle Stop Germs—and Cheese

► COWS treated with penicillin or streptomycin may stay healthy, but the milk they give will not make good cheese, dairy scientists have discovered.

Researchers from the Department of Agriculture and the Florida Agricultural Experiment Station reported separately last week that antibiotics seem to inhibit the starter mechanisms in milk which begin the transformation into cheese.

The discovery may be of future significance to the dairy industry, they told the annual meeting of the American Dairy Science Association, at Ithaca, N. Y.

Science News Letter, July 8, 1950

MEDICINE

Gastrin May Partially Cause Stomach Ulcers

► DISCOVERY of a stomach hormone, called gastrin, which could play a part in causing ulcers, was announced by Dr. Lester R. Dragstedt and associates of the University of Chicago at the meeting of the American Medical Association.

The hormone is produced by the lower part of the stomach, or antrum. It is only produced when the antrum is in contact with food. Its possible role in ulcer production was found in studies on dogs. Transplanting the antrum from the stomach to the intestines in these animals caused over-secretion of stomach juice in the rest of the stomach and formation of peptic ulcers.

The antrum-gastrin action is responsible for about 40% to 45% of stomach juice secretion and another 40% is due to nervous stimulation. In duodenal ulcer patients this nervous stimulation is markedly exaggerated and accounts for up to 80% of the total secretion.

Cutting the vagus nerves to the stomach brings immediate relief to ulcer patients and keeps them well. Of 509 patients who had this operation during the period 1943 to 1950, 408 or 80% are entirely well at the present time. They are back at their usual occupations without having to follow any diet or take any medicine.

Another 54 are apparently free of active ulcer disease but complain of some symptoms, so they cannot be considered entirely cured. Another 47 of the patients are considered failures.

Dr. Dragstedt's exhibit of the hormone discovery studies won the AMA Gold Medal for presentation of original work.

Science News Letter, July 8, 1950

SCIENCE FIELDS

MEDICINE

Brain Waves of Patient Control Anesthetic

► A NEW kind of electronic brain made its debut at the American Medical Association in San Francisco. This brain is for putting patients to sleep during operations.

It is operated by the patient's own brain waves, so that the patient is giving himself his own anesthetic and controlling the amount of it while he sleeps and the surgeon operates. The brain was devised by Dr. Reginald G. Bickford of the Mayo Clinic and has already been used successfully on more than 50 patients during operations.

Last year at the American Medical Association meeting, Dr. Bickford showed that brain wave records could be used by the anesthetist to gauge the degree of unconsciousness. With this as a guide, the amount of anesthetic could be increased or decreased as needed.

The new device goes a step farther and harnesses the brain waves themselves to regulate the amount of anesthetic being pumped into the patient's veins or into an ether vaporizer and mask. The brain waves are the fluctuations in electrical potential accompanying brain activity. As anesthesia deepens, this activity and the energy output of the brain waves grow less and less.

The machine does not do away with the anesthetist, but relieves him of much tedious work. It was called a milestone in the field of anesthesia by Dr. Charles W. Mayo of the Clinic's surgical division.

"It is the first time," he said, "that a purely automatic method of administering anesthesia has ever been attempted."

It may have value, he pointed out, in certain mental conditions or physical states in which a constant degree of controlled rest and relaxation may be desired.

Science News Letter, July 8, 1950

MEDICINE

Streptomycin Cuts Death Rate from Radiation

► RATS given a lethal dose of atomic radiation have been saved from death by the new wonder drugs, the antibiotics, in University of Chicago laboratories.

Streptomycin cut the death rate from radiation injury from 81% to 16% in one group of rats. It showed better protection against the internal infection which follows radiation than any other antibiotic tested, a research team headed by Dr. C.

Phillip Miller reported in the journal *Science* (June 30).

Results with aureomycin, golden-yellow mold-grown drug, were irregular. One experiment showed a significant reduction in the death rate. Another experiment showed none. A combination of penicillin and streptomycin, as well as the lesser known antibiotic chloramphenicol, were less effective than streptomycin alone.

The experiments supported the belief that much of the danger of atomic bomb attack lies in blood infection following intense radiation.

Dr. Miller and his associates, Carolyn W. Hammond and Marianne Tompkins, say that germ-killing drugs, to be effective, must be active against a wide variety of bacteria.

Science News Letter, July 8, 1950

AGRICULTURE

Weed-Killer Prevents Off-Flavor Milk

► WILD onions, weeds that make cows turn out milk with an off-flavor, may soon be tamed with a new weed-killer called maleic hydrazide.

Tests begun last November by a Department of Agriculture scientist, Vernon C. Harris, in cooperation with the Mississippi Agricultural Experiment Station, have begun to pay off. While the onions only turned yellow after the treatment, by May of this year they had died.

Work is still needed to learn how much of the chemical can safely be used on a pasture. It is not believed the substance would be toxic to cows grazing on sprayed areas.

Science News Letter, July 8, 1950

MEDICINE

Inaudible Vibrations of Heart Are Dominant

► HEART vibrations of low-frequency that cannot be heard by the human ear are the dominant vibrations produced by the heart's mechanical activity, Dr. Franklin D. Johnston of the University of Michigan reported at the meeting of the American Heart Association in San Francisco.

He has worked out a method of recording both these inaudible heart vibrations and the audible ones simultaneously with a record of the heart's electrical activity, or an electro-cardiogram. The method involves the use of equipment for separate registration of curves which represent the velocity and amount of in-and-out movement of the chest wall as a result of the heart's mechanical activity.

This is the first time, he said, that both types of records have been studied and distinguished clearly one from the other. The new method is expected to give valuable aid in diagnosing heart conditions.

Science News Letter, July 8, 1950

MEDICINE

Bacitracin Fights Amebic Dysentery

► BACITRACIN, the antibiotic drug first obtained from germs in the leg wound of a girl injured in an accident, is proving an effective weapon against amebic dysentery.

The antibiotic stops acute attacks of amebic colitis, and routs the ameba from the intestines. Ulcers heal and patients recover completely. These good results in eight severe cases are reported by Drs. Harry Most, J. W. Miller, E. B. Grossman and Neal Conan, Jr., of New York in the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* (July 1).

Relapse occurred in one patient within nine months, and another three had reappearance of amebas but no symptoms. In one severe case bacitracin cured the patient after other anti-amebic drugs and antibiotics, including aureomycin, had failed.

Of 43 mildly sick patients or patients with amebic infection but no symptoms, 80% were apparently cured by one or more courses of bacitracin treatment. The probability of cure from a single course of treatment is 66%. The drug was given by mouth. Toxic symptoms were negligible.

Science News Letter, July 8, 1950

METEOROLOGY

30-Day Weather Forecasts 79% Accurate

► THE United States can now know what its weather will be 30 days in advance with an accuracy of 79%. This is the record of the extended forecasts of the U. S. Weather Bureau during the first three months since they were first made public.

From Feb. 17 on, the Extended Forecast Section of the Weather Bureau has made seven twice-monthly 30-day predictions which can now be checked with the weather as it actually was. In those seven forecasts, 31 predictions were made about the temperatures and the rain or snow in various parts of the country. Of these, 23 were correct, three were half right and half wrong, and five were incorrect.

Science News Letter, July 8, 1950

GENERAL SCIENCE

Cortisone Discoverers Get Passano Award

► DISCOVERY of cortisone and its application to the relief of rheumatic diseases brought the \$5000 Passano Foundation award this year to Drs. Philip S. Hench and Edward C. Kendall of the Mayo Clinic. The award was presented at the meeting of the American Medical Association in San Francisco.

Science News Letter, July 8, 1950

ENTOMOLOGY

Insects on the March

Damage from bugs increases while man fights back. Their diet ranging from cotton to fruit, these insects eat more than 10% of each year's food crop.

By SAM MATTHEWS

► INSECTS this year will do more than four billion dollars damage in the United States.

They will take one bite of our food, the first bite, for every nine that humans take. They will ruin whole forests and fields.

Farmers and scientists will fight back with planes, poison gas, fire and deadly fogs. But odds are on the bugs this year. Government experts expect serious trouble. They say millions of eggs normally killed by cold have survived the mild winter.

On the Western plains, grasshoppers. In the corn belt, the dread European borers. In the South, boll weevils. Other insect pests are gorging themselves in the fruit orchards of the Pacific Northwest, gnawing through Virginia tobacco, tunneling with gusto into New England potatoes and apples.

In the past ten years, the U. S. Department of Agriculture estimates, annual national loss to insects has risen from \$3,000,000,000 to \$4,000,000,000.

This was despite development of such potent new insecticides as DDT, benzene hexachloride (known to farmers as "666") and methoxychlor, a super-DDT which is non-poisonous to men or animals. Foreign parasites have been imported to feed on insect pests. Bacteriological warfare—fighting insects with disease germs—is being tried by University of California scientists. Rigid quarantines, fumigation, poisoned bait, burning wheat fields, plowing under larvae-riddled cornstalks—all these are among man's weapons.

A Bad Year in 1950

Yet the Agriculture Department has issued a warning to farmers early in the spring: brace yourselves, this will be a bad year.

Huge numbers of grasshopper eggs were found in surveys last fall. Chief threat appears to be in Montana, North Dakota and Wyoming. But epidemic swarms may appear from Texas to Canada and west to California.

Losses to grasshoppers on farmland and ranges were the highest last year since 1939. Conservative estimate for crops alone was \$27,500,000, Agriculture said. It would have been many times that figure but for an all-out sowing of poisoned bait from low-flying planes. The program saved about \$55 for each dollar spent, the Bureau of

Entomology reports. Chemicals known as chlordane and toxaphene were new weapons.

European corn borers spread into 145 more counties in the United States in 1949. Now infested by this flesh-colored worm: 1312 counties in 29 states. Moving slowly westward, the corn borer destroyed nearly \$350,000,000 in crops last year—four times the number of bushels of corn ruined the year before.

"The pest will do even more damage in 1950 if weather is favorable," the Agriculture Department warns.

Farmers have been battling the corn borer since it arrived in this country in 1917. They plow under corn stalks, burn them, spray them with DDT and even the deadly poison parathion. Still the borers' numbers increase.

Boll Weevil in Full Force

Third pest expected to attack in record strength is the cotton-destroying boll weevil. After a "successful winter", record numbers of the dread weevils were hatching this month—they may top the 1949 plague figure of \$470,000,000.

Wheat ranchers search for telltale signs of the greenbug. In the early 1940's they licked an invasion of the wheat-eating Hessian fly by burning grain fields. They do not like the memory. But the greenbug aphid has already caused serious losses in the winter wheat crop. It may run rampant as far north as the Dakotas later in the summer.

These are the crop pests which the Department of Agriculture deems most dangerous for 1950. There are about 600 major pest species on its lists. Dr. Charles T. Brues, Harvard entomologist, estimates that nearly half of the 800,000 known insect species in the United States feed directly on plant tissues.

"More than 10% of each year's food crop goes to insects," he says.

The pink bollworm feeds on cotton, the green peach aphid on tobacco. The golden nematode likes Long Island potatoes. There are the pear psylla, sweet potato weevil, Mexican and Oriental fruit flies. The latter invaded Hawaii from Saipan near the end of World War II. Desperate steps are being taken to keep it from U. S. shores.

In forest areas, where rangers protect a vital U. S. crop, Agriculture Department C-47's lay acres of insecticide fog. They fight the spruce budworm in Oregon and

Washington, pine bark beetles in Wyoming, gypsy moths on Cape Cod.

Entomologists believe they could eventually stamp out any variety of insect pest if they had funds for an all-out war. By soil poisoning and the so-called "milky disease" they can massacre the Japanese beetle. In Florida in 1929, a one-year blitz against the Mediterranean fruit fly blasted that dangerous invader off its beachhead completely. The cattle fever tick, once costing uncounted millions in livestock losses, has been virtually eliminated.

Complete Riddance Impossible

There are reasons they cannot rid the U. S. of all its pests: 1) It would cost billions; 2) There is the danger of poisoning crops themselves; and 3) They might kill insects which are the friends of man.

Bees and other insects carry the all-important pollen to many plants. But wild pollinating insects have virtually disappeared in many localities after new insecticides have been used. Crops compete for bees. The government is even experimenting with breeding pollinating insects to relieve the shortage.

Only in the case of major pest threats does the government itself enter the eradication battle. It contents itself with research, information services, promotion of the natural enemies of insect pests and quarantines



GRASSHOPPER GANGSTER — One of the ringleaders of the insect gang which will rob the nation of four billion dollars in 1950, the grasshopper, in closeup, with his cohorts can ruin entire fields of wheat or pasture ranges in a single day.



CHOMPING PEST—The corn earworm and European corn borer will ruin many a succulent ear of corn during the summer months.

between states and countries. County farm bureau agents advise the farmers how to meet the pests.

Against their best efforts, the bugs gain here and there. Over the nation this year, the loss will be close to the amount of Marshall Plan aid sent overseas. Farmers, then the public, will pick up the check.

Science News Letter, July 8, 1950

SOCIOLOGY

Do Non-Drinking College Girls Get More Dates?

➤ COLLEGE girls who do not drink have more dates than college girls who do drink—at least at the University of Rochester. This is in contradiction to findings of a survey made two years ago at the Pennsylvania State College, where the drinking girls had more dates than the non-drinkers.

At the University of Rochester, non-drinkers had an average of two and one-third dates in a two-week period, while drinkers dated an average of one and one-quarter times in the same period.

These figures were revealed in a survey conducted recently at the University of Rochester under the direction of Frederic C. Berezin, instructor in sociology, and reported by him and Norman R. Roth in the QUARTERLY JOURNAL OF STUDIES ON ALCOHOL (June).

A sample of 383 girls was used, 48 of whom did not drink and 335 of whom did.

The study also disclosed that, at the University of Rochester, drinkers and non-drinkers became engaged in about the same percentages. Two years ago, at Penn State

it was found that non-drinkers had the edge over drinkers in making a permanent attachment.

The Rochester study also found that sorority girls drank more than non-sorority girls on both dating and non-dating engagements. Another finding was that out-of-town girls who live in dormitories drink more than Rochester girls who have homes to go to.

The authors concluded that the findings of the investigation "raised more questions than they answered."

Science News Letter, July 8, 1950

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MEDICINE

40 to 80 Cataract Cases In Atom Bomb Survivors

➤ ABOUT 40 certain cases of cataract and an additional 40 suspected cases have been discovered in atom bomb survivors by the Atomic Bomb Casualty Commission.

These make up the first evidence of the delayed effects of the atom bombings at Hiroshima and Nagasaki. Survivors have apparently recovered from the acute or immediate effects, such as loss of hair, temporary infertility and blood changes, the ABCC reports to the National Research Council and the Atomic Energy Commission in Washington, D. C.

The 80 certain or suspected cases of radiation cataract were discovered in a survey of 1,000 persons most of whom were within 3,000 feet of the point above which the bomb exploded. The survey was made after discovery of radiation cataracts among research workers in the United States who had been exposed to radiation similar to that released in an atomic bomb burst.

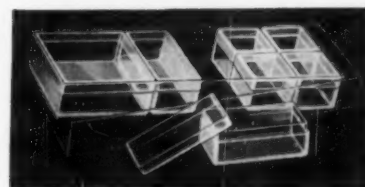
In the search for possible other delayed effects of the bombing on either survivors or their children, some 35,000 births have been investigated, a survey of 5,000 marriages has been made to determine the frequency of marriages between blood relations of varying degrees, about 2,800 children (some exposed to the bombs and some not) have been examined and medical examinations of newborn babies are being made at the rate of 700 and 800 a month.

Much of the effort of the ABCC has been expended in learning more about the normal state of health of the Japanese people in order to have a baseline of abnormalities occurring without atom bombing for comparison with those occurring in survivors of the bombings.

Science News Letter, July 8, 1950

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ASTRONOMY

Why Mars Is Red

► THE red color of Mars is due to rocks on the surface of the planet that are naturally red colored.

This was the view expressed in Bloomington, Ind., by Dr. Clyde Tombaugh, discoverer of Pluto and at present in charge of telescopic observations of V-2 and other rockets-in-flight at White Sands Proving Ground. He discussed the geological significance of markings on the planet Mars with members of the American Astronomical Society meeting.

Dr. Tombaugh believes that the lower temperature of Mars' surface, compared to the earth's temperature, may mean that the surface is little affected by chemical action and that the desert areas of Mars consist of rhyolitic igneous rocks, which are naturally red in color.

Some scientists have proposed that the red color of the planet is the result of oxidation of its surface by what little oxygen the atmosphere may have had at one time.

Rounded oases observed in many places on Mars could be the sites of impact craters caused by the collisions of small asteroids. Great dust clouds on the planet indicate the presence of wind, and wind erosion would smooth out the abrupt slopes of the impact craters.

These oases show seasonal change and a dark color. Dr. Tombaugh suggests that

vegetation similar to earthly lichens finds a favorable environment in the pulverized igneous rock and shelter offered by the crater of each oasis.

The idea of intelligent life as the maker of canals on Mars was definitely rejected by Dr. Tombaugh. He believes the canal-like markings are real, however, and that they can be seen by practiced observers.

The radial pattern of the canals with respect to the oases is attributed to fracturing of a thick crust under strain by the impact of asteroids that created the oases. The fractured zones could give haven to a hardy vegetation in regions of unfavorable environment, and at certain seasons this vegetation might absorb the slight moisture present in the Martian atmosphere after the polar caps evaporate and melt after each Martian year.

Mars is a planet about one-half the diameter of the earth. It requires nearly two years to go around the sun, and its average distance from the sun is about one and one-half times that of the earth. The temperature on the planet at its equator in the summertime equals in warmth only that of a spring day in the temperate zones of the earth. Recently Dr. Seymour L. Hess, at Lowell Observatory, has shown that weather changes may occur on Mars similar to those on the earth.

Science News Letter, July 8, 1950

MEDICINE

Remedy for Aching Joints

► IF you are over 50, you probably have aching joints. But don't worry. Heat and rest will ease the pain and if you don't overdo at sports, you can probably go on working for many years.

This, in brief, is advice from Dr. Walter M. Solomon of Western Reserve University, Cleveland. He gave more details, in more technical terms, in his report to the American Medical Association meeting in San Francisco.

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"Surveys have shown that practically everyone who lives to be 50 years of age or older will complain mildly or bitterly about one or more of his joints, with the vast majority of complaints due to the degenerative form," Dr. Solomon said.

The characteristic change in the progress of the disease is degeneration and the eventual wearing away of the cartilage, the gristle or white elastic substance attached to articular bone surfaces. This may take months or years. It is usually considered to be the result of wear and tear of life, Dr. Solomon pointed out.

"Since articular cartilage is insensitive, the pain is probably due to secondary changes in other structures, including such factors as muscle spasm brought on by stresses and strains, irritation of other tissues, such as bursae, tendons, and the like, the elevation of the periosteum (the tough fibrous membrane surrounding a bone) and loose bodies in the joints," he added.

"The physical measure most effective in relieving pain, stiffness and muscle spasm is heat in various forms, including infrared lamps, bakers, compresses, baths, paraf-

fin and diathermy. The use of heat produces definite physiological effects which have been well substantiated."

Rest is an important part of the prescription, he said. Excessive exercise is to be avoided.

Science News Letter, July 8, 1950

BOTANY-PALEONTOLOGY

Seedlings Are Living Experiment of Dead Age

► SCIENTISTS have reached back 30 million years through time in a "live" experiment on a period of the earth's history known only through fossils.

Seedlings of the Dawn Redwood, recently found living in the interior of China after it had been thought to have been extinct for millions of years, play the leading role in this experiment.

The seedlings, germinated from seeds brought out of China two years ago, were planted last year in half a dozen locations in Alaska, where forests of the Dawn Redwood flourished in past ages.

Reports arriving in Berkeley, Calif., indicate that most of the young trees, covered by snow for many months, have survived one of Alaska's most severe winters. Of 66 seedlings planted, 46 are known to be alive—at Anchorage, Ketchikan, Cordova, Sitka and Juneau. Five have died and 15 are still under snow.

The past winter has been a good test of the ability of the trees to survive indefinitely in the Alaskan environment, says Dr. Ralph W. Chaney, professor of paleontology at the University of California, who initiated the experiments.

This is quite surprising to scientists, Dr. Chaney added, since it has been supposed that the Dawn Redwood required a milder climate. It now lives in a much milder climate in China. Furthermore, scientists have believed that the tree was driven out of Alaska and other northerly regions by the encroachment of cold in past ages.

The results are forcing scientists to question some opinions they have long held, Dr. Chaney said. For example, it now seems possible that the climate of the northerly regions where the tree flourished may have been colder than is generally believed.

The results also warrant speculations on the possibility that the climate of Alaska may now be gradually changing to a warmer one, Dr. Chaney added.

This year Dr. Chaney plans to extend the experiments. He will send 125 more seedlings to Alaska for planting in such places as the Aleutians and as far north as Fairbanks. He may also send seedlings to Iceland, Greenland and Spitzbergen, where fossils of the Dawn Redwood, called *Metasequoia*, have been found.

The scientist said seedlings of the *Metasequoia* are thriving especially well in California, where about 1000 have been planted.

Science News Letter, July 8, 1950

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Examining specimen on metallographic microscope at Bell Telephone Laboratories

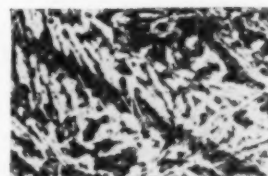
The look that keeps telephone costs **DOWN**

Through his microscope this Bell metallurgist examines a bit of material which is proposed for telephone use. From what he sees of grain structure, he gains insight into performance not provided by spectrum or chemical analysis. He learns how to make telephone parts stand up longer, so that telephone costs can be kept as low as possible.

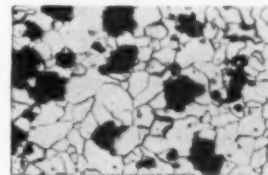
The items which come under scrutiny are many and varied, ranging from manhole covers to hair-thin wires for coils, from linemen's safety buckles to the precious metal on relay contacts.

In joints and connections—soldered or welded, brazed or riveted—photomicrographs reveal flaws which would escape ordinary tests. They show if a batch of steel has the right structure to stand up in service; why a guy wire let go in a high wind or a filament snapped in a vacuum tube; how to make switchboard plugs last longer.

In their exploration of micro-structure, Bell Telephone Laboratories scientists have contributed importantly to the metallographic art. You enjoy the benefits of their work in the value and reliability of your telephone service, and its low cost.



Photomicrograph of white cast iron which is hard and brittle.



Same iron rendered malleable by heat treatment. Shows spots of nodular carbon.

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Gila Monster

► GILA monsters are among the ugliest creatures alive. If the creatures were endowed with man's sensitivity to beauty and ugliness, it seems safe to say that the males and females would never be able to overcome their mutual repugnance, and the genus would simply die out.

Gila monsters belong to the genus *Heloderma*, and the two species are appropriately named *H. suspectum* and *H. horridum*. To all but the most avid gila monster-lovers (there are such people, as you will read further on), both species are equally suspect and horrid.

For one thing, the gila monster enjoys the dubious distinction of being the only lizard known to be poisonous. It is no hit-and-run poisoner like the snake. Once it strikes, it hangs on with all the tenacity of a bad conscience. While maintaining a bulldog grip, the gila monster works its jaws, apparently to insure that the venom from its grooved lower teeth gets into the wound.

In the Southwest where gila monsters are found, some people, possibly out of loneliness, make pets of them. It is said that after a few weeks of captivity, they become "reasonably tame" although they are still nervous and therefore not completely trustworthy.

However, reptile expert Dr. Raymond Ditmars tells us, "after a few months this nervousness wears away. Then they are the personification of good nature, permitting themselves to be handled in the most unceremonious fashion, without the least show of temper."

He offers one caution: Basking in warm sunlight seems to have the effect of reviving in even the most domesticated gila monster its former anti-social ways. A disturbed sunbather will bite the hand that feeds it or any other.

To scientists it is something of a puzzle just why the gila monster should be poisonous. Although it is sometimes known to kill small animals like mice, its principal food is believed to be eggs of snakes and other lizards. Obviously, poison is not necessary for stealing eggs.

The gila monster found in Arizona and

New Mexico has a short stubby tail. Its color is pink or orange with contrasting marks in black. In the Mexican and Central American species the tail is longer, the head is all black, and the light color

is a pale yellow. This species is sometimes called the beaded lizard, with the more familiar name, gila monster, being reserved for the United States species.

Science News Letter, July 8, 1950

ASTRONOMY

Cigar in Milky Way

► SOMETHING that looks like a slightly bent cigar has been seen in the Milky Way. It was reported by two astronomers in Ann Arbor, Mich.

While humorists hearing their report might have wondered whether it was tossed from a flying saucer, the astronomers themselves explained that the bent-cigar-looking object is an obscuring cloud or group of clouds of inter-stellar gas and dust.

The cigar-shaped object divides the Milky Way into two branches easily visible to the naked eye, the astronomers said at the dedication of the Heber D. Curtis Memorial Telescope of the University of Michigan.

The astronomers reporting this object are Dr. J. J. Nassau of the Warner and Swasey Observatory, Cleveland, and Dr. W. W. Morgan of the University of Chicago's Yerkes Observatory. For two years they have been studying stars of high surface temperature and great brilliance.

These stars are all at least 1,500 times as bright as our sun and many of them are over 10,000 times as bright.

The two astronomers suggested that our sun is located near the outer border of a spiral arm in our galaxy. If you can picture a large spiral pinwheel, made up of 100,000,000,000 stars intermingled with clouds of dust and gas, you can get some idea of our galaxy, commonly called the Milky Way.

The spiral arm in which we are located extends roughly from the constellation of Carina to Cygnus, the swan. This spiral arm contains the obscuring cloud. Other galaxies also appear to have spiral arms, they stated.

At the same meeting, Dr. Walter A. Baade of Mount Wilson and Palomar Observatories in California suggested that the Andromeda Galaxy, one of the closest to our own could serve as a model for studying ours.

The astronomers held a day-long symposium on the structure of the galaxy, bringing together what is known of it and discussing methods to improve our knowledge of it.

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OCEANOGRAPHY

Gulf Stream Meanders

► THE Gulf Stream does not stay put. It meanders far from its supposed course, sometimes doubling back on itself, sometimes looping so that it creates vast eddies which break off from the stream.

Rear Admiral Edward H. Smith, who recently retired after 40 years service with the Coast Guard and became director of the Woods Hole Oceanographic Institution, said that this view of the action of the Gulf Stream was confirmed by a recent six-vessel survey of the current. He spoke over the Columbia network as guest of Watson Davis, director of Science Service.

Adm. Smith said that the new knowledge of the Gulf Stream was due in great part to the use of loran—a war-developed radio system of navigation—which permits survey ships to fix their positions as often as they wish. Before loran was introduced it was only possible to achieve accurate fixes twice a day, he said, and thus only the net effect of a current over a half day was known.

"Probably the Gulf Stream is an extreme case," Adm. Smith said. "When other currents are studied as intensively as the Gulf Stream has been studied, it may be found

that they are somewhat steadier. However it is already clear that the variability of the ocean circulation is much greater than had been anticipated."

Right now, Adm. Smith said, oceanographers are studying the how and why of currents. After that picture is clear, the job will be to find out how currents affect the weather. He pointed out, however, that the Gulf Stream would have an effect on the weather in Europe, not in the United States.

"Ocean circulation is much like air circulation," Adm. Smith said, "but it is much slower. A week in the ocean is apparently equivalent to a day in the air, so far as circulation is concerned."

The new director of the Woods Hole Institution said that oceanography is just about entering the phase where it can begin to forecast ocean circulation. With new investigational techniques and instruments, he concluded, oceanographers will be able to describe the movements of the ocean accurately and will be able to understand just what sort of an ocean we are dealing with.

Science News Letter, July 8, 1950

Books of the Week

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ARCHAEOLOGICAL SURVEY OF OWEN COUNTY, INDIANA—Vernon R. Helmen—*Indiana Historical Bureau*, 49 p., illus., paper, free upon request to publisher, 408 State Library and Historical Bldg., Indianapolis 4, Ind.

BOLETIN DE CIENCIA Y TECNOLOGIA—Office of Science and Technology—*Pan American Union*, No. 1, 47 p., illus., paper, free upon request to publisher, Washington 6, D. C. Quarterly publication reporting advancements throughout the western hemisphere in science and technology. In Spanish.

COLLEGE CHEMISTRY: An Introductory Textbook of General Chemistry—Linus Pauling—*Freeman*, 705 p., illus., \$4.50. Well illustrated.

CONTROL OF ODORS—Elmer R. Weaver—*Gov't. Printing Office*, Nat'l. Bureau of Standards Circ. 491, 12 p., paper, 10 cents. General information on the practical control of industrial and household odors.

THE CRUSTACEA DECAPODA MACRURA COLLECTED BY THE ARCHBOLD NEW GUINEA EXPEDITIONS: Results of the Archbold Expeditions No. 63—L. B. Holthuis—*American Museum of Natural History*, 17 p., illus., paper, 25 cents.

CURRENTS IN NUTRITION: Proceedings of the Nutrition Symposium held at The University of Illinois, College of Medicine, Nov. 19, 1949—Bertha Burke and others—*National Vitamin Foundation*, 128 p., paper, \$1.00.

DIETS OF FAMILIES IN THE OPEN COUNTRY: A Georgia and an Ohio County, Summer 1945—Sadie F. Adelson and Ennis C. Blake—*Gov't. Printing Office*, U. S. Dept. of Ag., Misc. Publ. No. 704, 90 p., illus., paper, 25 cents.

EXERCISES IN GENERAL CHEMISTRY—Harold G. Dietrich and Erwin B. Kelsey—*Macmillan*, 285 p., illus., paper, \$3.00. An introductory college laboratory manual.

INTRODUCING THE INSECT—F. A. Urquhart—*Holt*, illus., \$5.00. Describes the habits and classifications of insects. For the layman and the college student taking his first course in entomology.

MANAGEMENT OF INDUSTRIAL RESEARCH: A Selected and Annotated Bibliography—*Arthur D. Little*, 14 p., paper, free upon request to publisher, Memorial Drive at Kendall Square, Cambridge 42, Mass.

MEGASPORES FROM THE MICHIGAN COAL BASIN—Chester A. Arnold—*University of Michigan Press*, approx. 55 p., illus., paper, \$1.50. A report of spores found on coals and shales which were formed in the early Pennsylvania age.

A NEW TESTUDO FROM MADISON COUNTY, MONTANA—Thomas M. Oelrich—*University of Michigan Press*, approx. 15 p., illus., paper, 50 cents. A report on the discovery of a new species in the Miocene deposits of Madison County, Mont.

NUTRITION IN OPHTHALMOLOGY—John J. Stern—*National Vitamin Foundation*, 137 p.,

paper, \$1.50. Effects of different vitamins upon the eyes are discussed.

THE OVERTHROW OF THE PHLOGISTON THEORY: The Chemical Revolution of 1775-1789—James Bryant Conant, Ed.—*Harvard University Press*, Case II, 59 p., illus., paper, 90 cents.

THE PLANET MARS—Gerard de Vaucouleurs—*Faber and Faber* (U. S. Distributor: *Macmillan*), 87 p., illus., \$2.00. A monograph discussing many of the aspects of the planet Mars. Translated from the French by Patrick A. Moore.

PRE-TRAVERSE DEVONIAN PELECYPODS OF MICHIGAN—Aurele La Rocque—*University of Michigan Press*, approx. 100 p., illus., paper, \$2.00. The results of a study made by the author.

RESEARCHES ON THE AMPHIBIA OF OKLAHOMA—Arthur N. Bragg and others—*University of Oklahoma Press*, 154 p., illus., \$1.00. A study of the taxonomy, ecology and sex cycles of amphibia in Oklahoma.

ROBERT BOYLE'S EXPERIMENTS IN PNEUMATICS—James Bryant Conant, Ed.—*Harvard University Press*, Case I, 70 p., illus., paper, 90 cents. First of the Harvard Case Histories in Experimental Science designed to acquaint students who are majoring in the humanities or the social sciences with major events in science.

STRANGE SEA LIFE—Gladys Vondy Robertson and Vera M. Graham—*Holt*, 115 p., illus., \$2.50. The authors tell something of the interesting creatures found in the salt waters that encircle the world. For the layman.

THE SUPPLY AND DEMAND FOR GEOLOGISTS 1949-1950—William B. Heroy, Chairman—*American Geological Institute*, approx. 11 p., illus., paper, free upon request to publisher, 2101 Constitution Ave., N. W. Washington, D. C. A survey appraising the employment prospects in the geological field.

TEACHING BIOLOGY FOR APPRECIATION—Alfred F. Nixon—*Chapman & Grimes*, 143 p., illus., \$3.00. The author discusses different methods of teaching biology in secondary schools.

Science News Letter, July 8, 1950

MEDICINE

Blood Chemicals Used to Remove Kidney Stones

► CLOTTING chemicals from blood can be used to remove kidney stones without cutting open the kidney surgically.

The blood chemicals are fibrinogen and thrombin. Injected into the kidney through the tube from kidney to bladder, the chemicals form a clot around the stone making possible its withdrawal.

Doctors saw this new technique in a moving picture shown by Col. J. C. Kimbrough and Maj. Robert B. Rowe of Walter Reed General Hospital at the meeting of the American Medical Association in San Francisco.

Science News Letter, July 8, 1950

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No light is absorbed. Has a three-layered film which accomplishes non-absorption.

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AMAZING POCKET-SIZE 10-POWER SPOTTING SCOPE—Complete With Tripod and Swivel Head. Only 5 1/2" long—8 1/4" high on tripod. Adapted from Army telescope and worth many times our price.

Excellent for clarity and sharpness. Has prism erecting system, achromatic objective, Ramsden Eyepiece. Lenses low reflection coated. Ideal Scope for sportsmen and hunters.

Stock #955-Q. \$14.95 Postpaid
POLAROID VARIABLE DENSITY ATTACHMENT—Consists of two mounted Polaroid filters. Control knob rotates one about the other, giving variable density. Used in photography, experiments in polarized light, controlling light transmission, etc.

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Plate glass with etched parallel black lines—space between each line is same as thickness of the ruled line itself. Made by photographic process. Number of lines per inch ranges from 65 to 133 as shown below. Normally cost \$4.00 to \$5.00 per sq. inch. Used for testing astronomical mirrors, magnifiers. Used in pairs to see diffraction pattern. (Some seconds, with slight scratches).

1 in. x 1 in.				2 in. x 2 in.			
Stock No.	Lines	Per In.	Price	Stock No.	Lines	Per In.	Price
2122-Q	65	.75	\$.75	2133-Q	65	.75	\$1.50
2126-Q	85	.75	.75	2134-Q	85	.75	1.50
2127-Q	110	1.00	1.00	2136-Q	110	2.00	2.00
2128-Q	120	1.00	1.00	2137-Q	120	2.00	2.00
2129-Q	133	1.00	1.00	2138-Q	133	2.00	2.00

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❁ **TABLE TENNIS** device, for solo practice with a machine partner, has a net at one end of the table to catch the ball and drop it into a trough below. The ball then rolls into a device which shoots it, by vacuum-cleaner air-pressure, through a curved tube onto the table.

Science News Letter, July 8, 1950

❁ **GASOLINE TANKS** to fit into the waste fender area behind each rear wheel of the automobile make the customary gasoline tank space available to add to the baggage compartment. The simple idea, for which a patent is pending, does not change center of gravity or gasoline capacity.

Science News Letter, July 8, 1950

❁ **TRAILER COOLER**, electrically operated, is designed to circulate filtered, cool air directly down through a ceiling ventilator. The 90-pound device, complete with motor, blower, water-pump and accessories, is easily mounted on top of the trailer and no ducts are required for installation.

Science News Letter, July 8, 1950

❁ **VOLT-AMMETER** for the electrician is built to measure current without interrupting service. As shown in the picture,



this 12-ounce pocket instrument, in a plastic case, features two insulated split-core transformer probes which are opened by a plastic trigger to close around conductors.

Science News Letter, July 8, 1950

❁ **CLASSROOM LANTERN** slide, two-

by-two inch size, is made of a specially treated glass which can be written on by an ordinary pencil. Markings on it can be erased at will, making the slide usable over and over again.

Science News Letter, July 8, 1950

❁ **ELECTRIC HARPOON** for killing whales, developed in England and successfully used in the Antarctic during the past season, is attached to the vessel by a line which carries an electric current. This humane device kills almost instantly and saves time for the whalers.

Science News Letter, July 8, 1950

❁ **JUNIOR RECTIFIER**, low-cost instrument to deliver six-volt direct current from the ordinary 115-volt alternating current line, utilizes new heavy-duty selenium rectifiers plus accessories such as voltmeter and ammeter. It is designed for testing and demonstrating low-voltage devices.

Science News Letter, July 8, 1950

❁ **CANASTA SCORE** makes the progress of the game easy to keep by advancing pegs in holes opposite each side of the score values. Adding is done automatically on this durable plastic device, and the score is always visible to all players.

Science News Letter, July 8, 1950

Do You Know?

Ground corn cobs make an excellent material for garden mulch.

A pound of earthworms contains all the way from 120 night-crawlers known as glow worms to about 900 garden worms.

The *chigger*, a little red speck of a bug with a big bite, is really a mite and belongs to the same family as spiders, ticks and scorpions; it is often called the red spider.

Following the gigantic eruption of the volcano Krakatoa in Java in 1883, resulting dust in the atmosphere caused gorgeous sunsets as far away as England for months afterward.

The Dionne Canadian quintuplets, born in 1934, and the Diligenti set of five, born in Argentina in 1943, are the only two known cases of quintuplets who survived infancy.

Many names of stars are Arabic; this is because during the so-called dark ages in Europe, the Arabs cultivated a knowledge of the heavens and translated former Greek names into their language.

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